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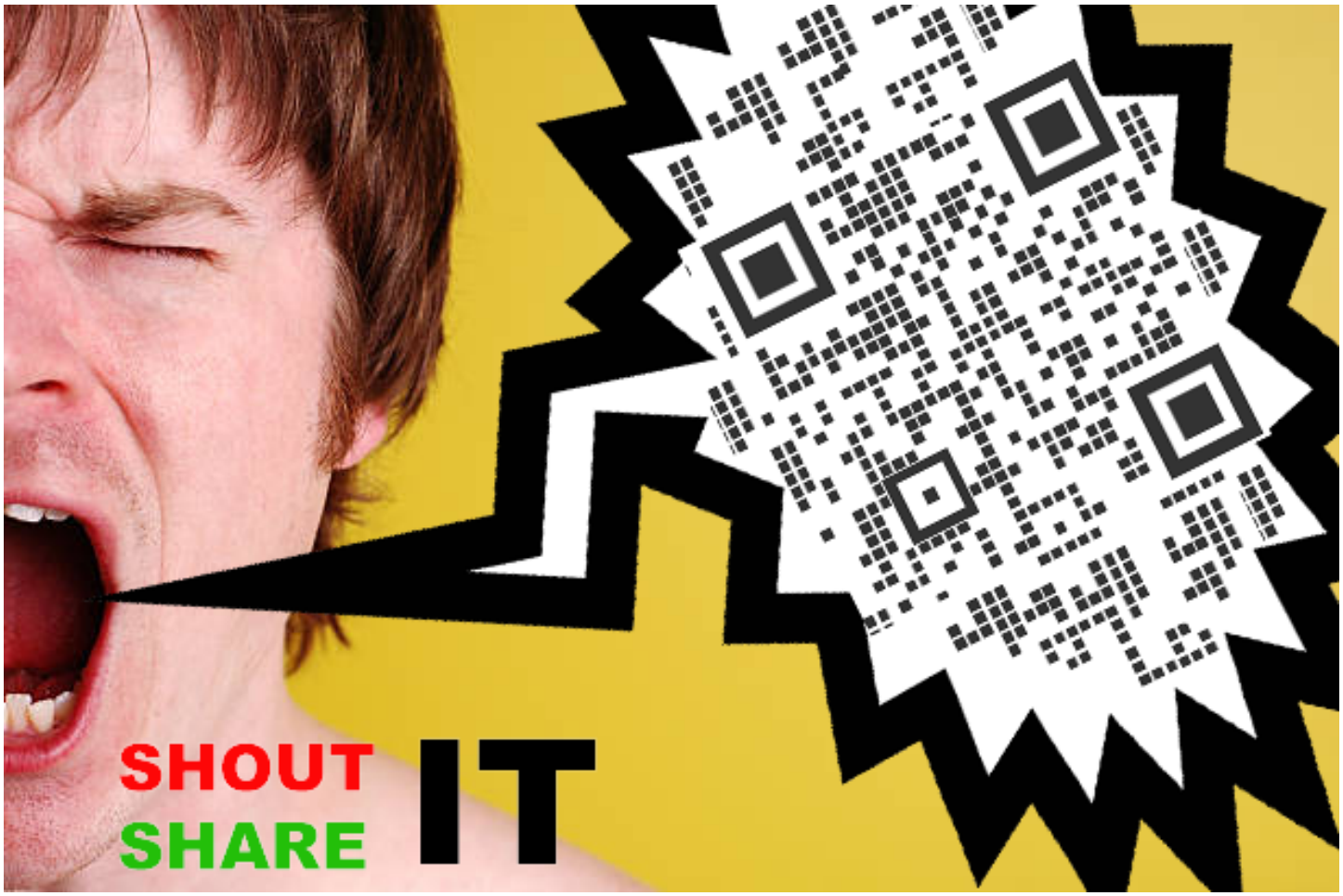
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Southwestern Forest Insect & Disease Bulletin

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SOUTHWESTERN REGION
U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

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CATERPILLARS STOP TRAIN

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Cars of the Cumbres and Toltec Scenic Narrow-gage Railroad were forced to a stop several times during the summer of 1971 when caterpillars of the western tent caterpillar, Malacosoma californicum, became thick on the tracks of the steep Rio Chama section. The caterpillars, migrating in search of food or pupation sites (niches where they transform from caterpillars to the adult moths), caused a grease-like condition on the

tracks. This periodic pest defoliated quaking aspen on 6,000 acres of private and National Forest land west of Chama, New Mexico, in the summer of 1971.

Tent caterpillars were also prevalent in other parts of the Southwestern Region this year. The Alpine District, Apache National Forest, Arizona, reported defoliation of aspen, wild rose, and Ribes spp. Defoliation of chokecherry and aspen was heavy on Mt. Lemmon, Santa Catalina District, Coronado National Forest, Arizona. The main effect of tent caterpillar defoliation is to reduce radial tree growth. However, substantial tree mortality can result from several consecutive years of damage. Indications are that the tent caterpillars will again be a problem throughout the Southwest in 1972.

WINDS BLOW IN OCTOBER

Gale-force winds, with velocities in excess of 70 m.p.h., on October 29, 1971, caused extensive blowdown in the ponderosa pine, mixed conifer, and spruce forests of the Southwest. Surveys to date show the heaviest damage on the Santa Fe National Forest in New Mexico, and Apache National Forest and Fort Apache Indian Reservation in Arizona. Blowdown is a favored host material for several important bark beetle pests, thus creating favorable conditions for population buildup and subsequent attack of standing green trees. Highest hazards are in Engelmann spruce and Douglas-fir stands where the trees are attacked by the spruce beetle and the Douglas-fir beetle, respectively. Blowdown in ponderosa pine type rarely leads to major insect problems. All areas of concentrated blowdown should be reported on Detection Report-Forest Insect and Disease Damage, form R-3 5200-5, for later examination.

AIR POLLUTION SURVEY

Surveys of forested areas for possible air pollution injury continued with the establishment of 35 observation areas in the Region. Table 1 shows eight existing or potential sources of air pollution in the Region, and the general location of the 35 observation areas. The observation areas were established in areas containing a wide variety of forest species and as near the sources as possible, thereby making the detection system sensitive to possible injury.

Results.--Symptoms typical of acute sulfur dioxide (SO_2) injury (interveinal necrosis/interveinal bleaching, or needle tip burn) were found on foliage of forest vegetation within 4 miles of the smelter stacks at Miami and Morenci, Arizona. Emissions from these smelters are approximately 400 and 1,100 tons of SO_2 per day, respectively. Chlorotic foliage, a symptom of several plant disorders including chronic SO_2 injury, was noted in several areas close to SO_2 sources. The significance of this has yet to be determined because this symptom was also found in areas far removed from sources of SO_2. More work must, therefore, be done to determine if SO_2 is causing chronic injury to forest vegetation.

Sulfation plates are being changed monthly by personnel from cooperating agencies. These plates are being used to determine if SO_2 and other sulfur compounds are reaching the vegetative observation areas. As would be expected, sulfur compounds were detected near smelting areas; however, the sulfation plate data have not yet been analyzed to see if there is a correlation between plant damage and sulfation rate.

Each vegetative observation area will continue to be examined yearly in late summer by Forest Service plant pathologists to detect air pollution injury should it occur, or, where new sources are expected, to gain background information about plant condition.

SPRUCE BEETLE CONTINUES

Spruce beetle populations, hard hit by the January 1971 freeze, remained active at lower levels causing moderate volume losses throughout the Region. Areas with activity are the Apache and Coconino National Forests and Fort Apache Indian Reservation in Arizona, and the Carson, Cibola, and Santa Fe National Forests in New Mexico. The October blowdown is expected to cause some resurgence in spruce beetle populations for the next several years.

Spruce beetle evaluation techniques were refined in 1971 using a variable sample plot and tailored computer program. This method gives the land manager more information concerning the infested stand's composition and beetle impact on the resource. Hopefully, these techniques will provide essential information to the land manager for recommending and supporting proposed programs.

FALL-TREATED TREES TRAP SPRUCE BEETLE

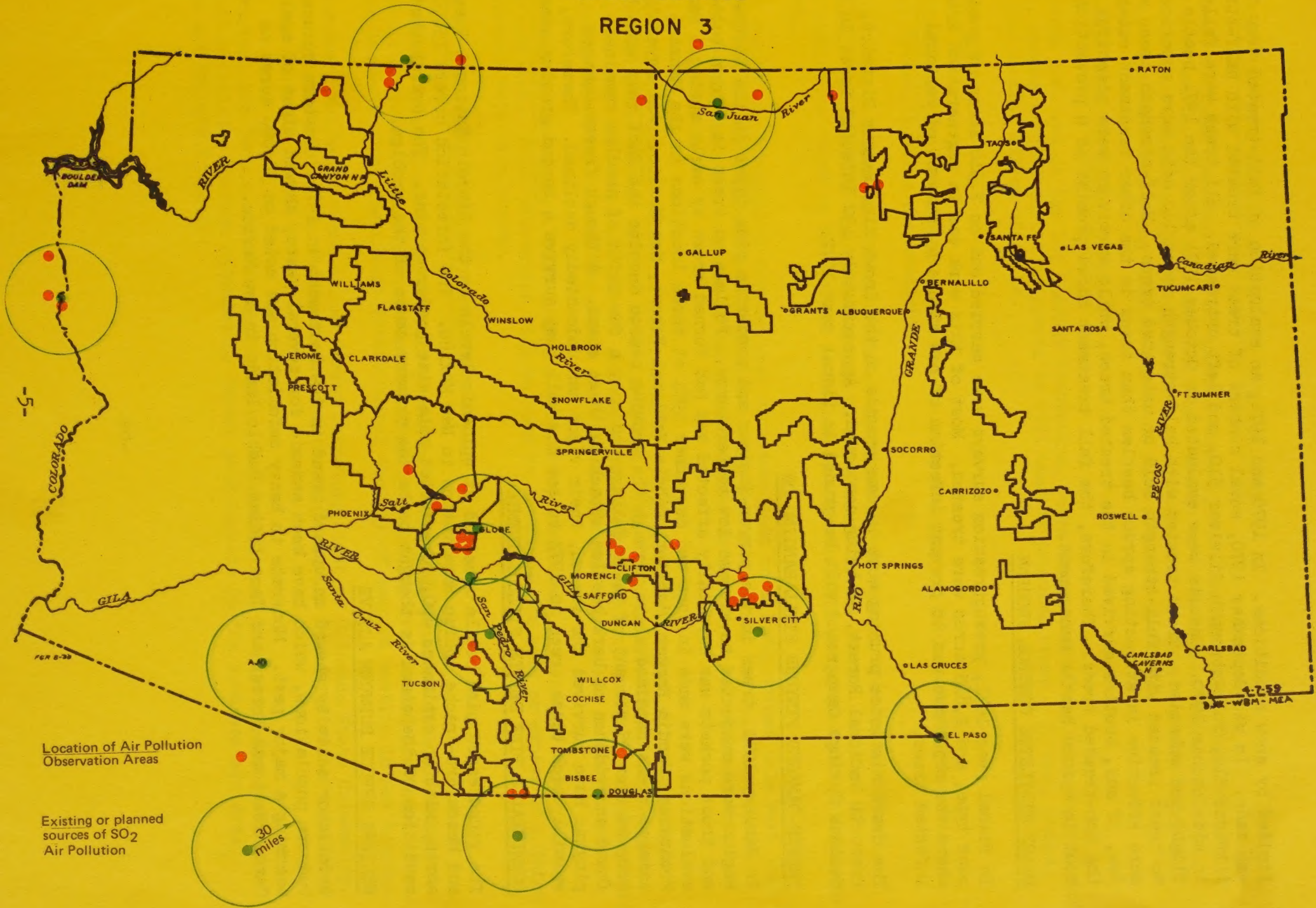
Our past evaluations have shown that green spruce trees treated in May or June with Silvisar 510 Tree Killer (cacodylic acid), and felled 2-4 weeks later, attract the spruce beetle, Dendroctonus rufipennis. Beetles in these trees fail to survive. In some spruce areas, treatment cannot be carried out in May or June because access is

Table 1.--Air Pollution Plant Injury Detection Network, New Mexico and Arizona, U.S. Forest Service, Region 3.

Source (Existing & Potential)	Location of Vegetative Observation Areas	Cooperating Organizations
Four Corners Power Plant, near Farmington, N. M.	Mesa Verde National Park	NPS
	Aztec Ruins National Monument	NPS
	Chuska Mountains, Navajo Indian Reservation	BIA
	Jicarilla RD, Carson NF	USFS
	Cuba RD, Carson NF	USFS
Kennecott Copper Smelter, Hurley, N. M.	Silver City RD, Gila NF	USFS
	Mimbres RD, Gila NF	USFS
	Wilderness RD, Gila NF	USFS
	Glenwood RD, Gila NF	USFS
Navajo Power Plant, Page, Ariz.	*Glen Canyon National Recreation Area	NPS
	Navajo Mountain, Navajo Indian Reservation	BIA
	South Rim, Grand Canyon	NPS
	Jacob Lake RD, Kaibab NF	USFS
Inspiration Copper Smelter, Miami, Ariz.	Tonto National Monument	NPS
	Sierra Ancha Experimental Forest	USFS
	Globe RD, Tonto NF	USFS
	Roosevelt RD, Tonto NF	USFS
	Tonto Basin RD, Tonto NF	USFS
PD Copper Smelter, Morenci, Ariz.	Clifton RD, Apache NF	USFS
Magma Copper Smelter, San Manuel, Ariz.	Santa Catalina RD, Coronado NF	USFS
PD Copper Smelter, Douglas, Ariz.	Coronado National Memorial	NPS
	Douglas RD, Coronado NF	USFS
	Patagonia RD, Coronado NF	USFS
Mohave Power Plant, near Bullhead City, Ariz.	*Lake Mohave RD, Lake Mead National Recreation Area	NPS

*Cooperating effort between Forest Service, Region 3, Albuquerque, New Mexico, and Forest Service, Region 4, Ogden, Utah.

AIR POLLUTION DETECTION SURVEY - 1971
U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION 3



limited by snow conditions. In 1970 and 1971, an evaluation of fall-treated trap trees was made. In mid-September 1970, equal numbers of trees were treated with half-strength Silvisar 510, full-strength Silvisar 510, and left untreated. All trees were felled in mid-October 1970. Results were evaluated in October 1971 after the 1971 beetle flight had subsided. Trees treated with half-strength cacodylic acid were superior to trees treated with full-strength acid or untreated trees. Half-strength trees were more effective in attracting spruce beetles than trees in the other treatment categories. Few, if any, beetles survived in the treated trees, while survivors were plentiful in the non-treated trees. Therefore, the fall treatment shows promise as a prevention tool in spruce beetle management.

DWARF MISTLETOE CONTROL PROGRAM

In fiscal year 1971, presuppression surveys were carried out on 7,910 acres of ponderosa pine type, and 2,815 acres were treated. Most of this work was in regeneration areas where the objective was to prevent infection of new stands by removal of residual infected trees.

The dwarf mistletoe pruning work in campgrounds on the Crown King Ranger District, Prescott National Forest, is being continued. Approximately 130 infected trees in the Kentuck Springs Campground will be pruned in fiscal year 1972.

FREEZE-DAMAGED PINYONS STILL HANGING ON

In January 1971, trees in the pinyon-juniper and ponderosa pine types in the Southwestern Region were subjected to extreme low temperatures. Foliage on trees in canyon bottoms and frost pockets was especially affected and had turned brown by early spring. Damage evaluations were made in June and September 1971 at three locations in the Manzano Mountains, Sandia Ranger District, Cibola National Forest, New Mexico. All severely damaged trees remained alive through the growing season despite the fact that some had dropped over 95 percent of their foliage and only a few tufts of needles remained. We found no evidence of bark beetles attacking these stems. Although freeze-damaged pinyons have survived one season, their vigor has undoubtedly declined. Therefore, we will check these trees in 1972 to see how well they survive a second growing season.

ROUNDHEADED PINE BEETLE STILL EPIDEMIC

The roundheaded pine beetle remained at epidemic levels on the Lincoln National Forest and Mescalero-Apache Indian Reservation in New Mexico. The infestation covers 150,000 acres, with an estimated 400,000 infested pole-size ponderosa pine. The overstocked condition of the stand is thought to be the primary cause of the problem.

WESTERN SPRUCE BUDWORM ACTIVE

Defoliator activity showed an upward trend in the Southwest in 1971. Western spruce budworm populations, which have been endemic for several years, showed signs of again becoming a major pest. Moderate to heavy defoliation was noted on 50,000 acres on Carson National Forest and Taos Indian Pueblo lands in New Mexico.

TEXAS ROOT ROT IS A PROBLEM AT BIG BEND NATIONAL PARK

Cottonwood cuttings imported from an eastern nursery, and planted on 300 acres of old cotton farmland in Big Bend National Park, have proven to be extremely susceptible to Texas root rot. More than 100 trees have died each year for the last 3 years. Less susceptible species are being planted where the root rot is a problem.

ARMILLARIA ROOT ROT KILLS SEEDLINGS

Armillaria root rot in the Los Conchas Plantation, Jemez Ranger District, Santa Fe National Forest, caused greater mortality losses in 1971 than in previous years. In one, $\frac{1}{2}$-acre plot, the disease killed 42 trees.

DISEASE NEWS

Need Mistletoe Cards?--Drop us a line if you need a supply of 6-class mistletoe rating cards. Several hundred are available.

New Mistletoe Supplement.--Instructions on dwarf mistletoe control can now be found in a Regional Supplement to the 5260 section in the Forest Service Manual. A list of dwarf mistletoes found in the Region is included, together with guidelines for silvicultural control.

To Our Pollution Friends.--A special word of thanks goes to all who helped this past year in carrying out the Regional air pollution survey and in changing the sulfation plates. Sulfation plate data and reports of specific findings in each area will be sent to you as soon as possible.

Navajo Mountain Survey.--Another special thank-you goes to the Bureau of Indian Affairs for arranging the recent trip to Navajo Mountain. Dr. Frank Hawksworth and Dr. Paul Lightle of the Rocky Mountain Forest and Range Experiment Station, and Regional pathologist Bob Loomis were able to make the first collections of dwarf mistletoes in that area.

Dutch Elm Disease Survey.--Data from the elm survey forms sent out earlier this year are being compiled. This information will be used to determine the need or extent of a Dutch elm disease detection survey.

TALKS BY INSECT AND DISEASE CONTROL STAFF

In December, entomologist Harold Flake presented a paper, co-authored with entomologist Bob Frye, entitled "Spruce Beetle Winter Mortality Resulting from Record Low Temperatures in the Southwest," at the annual Entomological Society of America meeting in Los Angeles.

In November, Mel Weiss spoke to the Forest Pathology Class at Colorado State University. Dwarf mistletoe control in the Southwest and the Regional air pollution detection survey were the subjects of his talk.

In October, Bob Loomis traveled to Asheville, North Carolina, to participate in an air pollution training session attended by forest pathologists in the Southeastern Area, State and Private Forestry.

During the summer and fall, our pathologists participated in four compartment examination training sessions. We would like to thank Bill Chapparo and the Branch of Silviculture and Management Planning for making this possible.

NEED HELP?

Let us know when you need help with insect or disease problems. Form R-3 5200-5, "Detection Report-Forest Insect and Disease Damage," can be used for this purpose, or give us a call at 505-843-2663 or 2440.

RECENT PUBLICATIONS

Buffam, P. E. 1971. Spruce beetle suppression in trap trees treated with cacodylic acid. J. Econ. Entomol. 64(4): 958-60.

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Buffam, P. E., and F. M. Yasinski. 1971. Spruce beetle hazard reduction with cacodylic acid. J. Econ. Entomol. 64(3): 751-2.

Frye, R. H., and N. D. Wygant. 1971. Spruce beetle mortality in cacodylic acid-treated Engelmann spruce trap trees. J. Econ. Entomol. 64(4): 911-6.

Hinds, T. E., and P. E. Buffam. 1971. Blue stain in Engelmann spruce trap trees treated with cacodylic acid. U.S. Forest Service Res. Note RM-201. 4 p.

Weiss, M. J., and J. W. Riffle. 1971. Armillaria root rot in a ponderosa pine plantation in New Mexico. Plant Dis. Reporter 55(9): 823-4.

Flake, H. W. Jr., C. K. Lister, and H. E. Meyer. 1971. A pruning head adapted to telescopic extension poles for sampling insect populations. J. Econ. Entomol. 64(6): 1557.

Reprints of these articles are available upon request.